REMARKS

Claims 7-12, 14-16 and 18 are pending. Claims 7, 8 and 18 have been amended. Claims 1-6, 13 and 17 were previously cancelled without prejudice. Support for amended claims 7, 8 and 18 can be found in the specification, for example, on page 7, lines 5-25; Example 3; Figures 6 and 7; and original claims 7, 8 and 18. It is respectfully submitted that no new matter has been introduced in this amendment.

I. Objection to the Specification

In the Office Action, the Examiner maintained the prior objection to the disclosure because "it contains an embedded hyperlink and/or other form of browser-executable code (see, for example, at least line 22, on p. 16 of the specification)." See Office Action, page 2, first full paragraph under the section heading "Specification- objection maintained."

Applicant has amended the specification by deleting reference to the embedded hyperlink and/or browser-executable code. Therefore, Applicant respectfully requests that the Examiner remove the objection.

II. Rejection under 35 U.S.C. § 103

In the Office Action, claims 7, 8, 11, 12, 16 and 18 were rejected under 35 U.S.C. § 103(a) as being obvious over Seki, et al. (1994, CA2104649), Bass (2001, Nature v. 411: 428-429, and Yu, et al. (2002, PNAS, v.99:6047-52).

Independent claims 7 and 18 have been amended in relevant part to recite: "An siRNA having a nucleotide sequence shown in SEQ ID No. 23" and claim 8 has been amended in relevant part to recite: "An siRNA having a nucleotide sequence which hybridizes under stringent conditions either with an RNA region of HCV having a sequence complementary to a nucleotide sequence shown in SEQ ID No. 23."

In the Final Official Action the Examiner rejected the present invention stating that "Seki, et al., teach an antisense nucleotide targeting HCV and complementary to SEQ ID NO: 23 and

that it is 20 nucleotides in length." See Final Office Action, page 3, lines 7 and 8 under the section entitled "Claims Rejections- 35 USC § 103-maintained". The Office Action further states "Bass provides a motivation to make a double-stranded RNA instead of an antisense oligonucleotide by teaching that RNA interference is more robust than antisense techniques by decreasing expression to lower levels and working at much lower concentrations than antisense." See Final Office Action, page 4, lines 13 to 15. The Office Action then concludes that "one of ordinary skill in the art would recognize that targeting HCV with an siRNA corresponding to SEQ ID No: 23 would be a more effective antiviral agent than just the antisense taught by Seki, et al." See Final Office Action, page 4, lines 17 to 19.

However, applicants respectfully submit that siRNAs work usually in the form of a double strand RNA, while antisense DNAs work in the form of a single strand DNA. Therefore, the mechanism of a siRNA in suppressing its target gene expression, as claimed in the present invention, is completely different from and irrelevant to the mechanism of an antisense DNA in suppressing its target gene expression as described in the Seki, et al. reference.

Applicants do not dispute the Examiner's citation to the Bass reference for the premise that RNA interference "has proven to be more robust than antisense techniques" and that they work "at concentrations several orders of magnitude below the concentrations typically used in antisense experiments." See Final Office Action, page 4, lines 3 to 7. However, applicants respectfully submit that the Bass reference does not mention that a siRNA having a nucleotide sequence complementary to an antisense DNA is more effective than the antisense DNA. In fact, the Bass reference is silent about the relationship between a nucleotide sequence of a siRNA and that of an antisense DNA. The Bass reference, as cited by the Examiner in the Office Action, merely describes that RNA interference techniques are better than antisense techniques, in general terms. Applicants respectfully submit that due to the difference of mechanisms between siRNAs and antisense DNAs, a person of ordinary skill in the art would not expect that a siRNA having a nucleotide sequence complementary to a known antisense DNA is more effective than the antisense DNA.

Thus, a person of ordinary skill in the art who reads the cited documents would not expect that the siRNA having a nucleotide sequence of the instant SEQ ID No: 23 of the present invention is more effective in suppressing a target gene expression than the antisense DNA having a nucleotide sequence of SEQ ID No. 83 taught by Seki et al.

Moreover, the specification of the present invention shows that R5-siRNA having the nucleotide sequence of SEQ ID No: 23 is most effective in the inhibition of HCV replicon activity among several other siRNAs also prepared in the present specification, including R2-siRNA having the nucleotide sequence of SEQ ID No: 21 and R6-siRNA having the nucleotide sequence of SEQ ID No: 24. See Specification, page 14, line 3 through page 15, line 5; Example 3 and Figures 6 and 7 of the present specification.

Although the Office Action seems to be assuming that siRNAs targeting the same site as known antisense DNAs are always effective as a substitute for the antisense DNAs, such assumption is not correct. Applicants note that SEQ ID No: 21 in the present application is complementary to SEQ ID No. 111 taught by Seki et al. and SEQ ID No. 24 in the present application is complementary to SEQ ID No. 113 taught by Seki et al. As noted in Example 3 of the present specification, R5-siRNA having the nucleotide sequence of SEQ ID No. 23 is surprisingly particularly effective among the siRNAs targeting the same site as known antisense DNAs. Thus, siRNAs having nucleotide sequences complimentary to known antisense DNAs are not always as effective as R5-siRNA. In view of the foregoing, the "siRNA having a nucleotide sequence shown in SEQ ID No. 23" as recited in claims 9 and 18 are not obvious over the cited documents in the present Office Action.

The Office Action admits that "Seki, et al. do not teach siRNAs." See Final Office Action, page 4, lines 1 to 2. Applicant respectfully submits that neither the Seki, et al. nor the Bass references teach or suggest "an siRNA having a nucleotide sequence shown in SEQ ID No. 23" as recited in amended independent claims 9 and 18 of the present invention.

The Office Action cites the Yu, et al. reference stating that "Yu, et al. teach that siRNAs can be expressed from a vector. However, Yu does not teach or suggest "an siRNA having a nucleotide sequence shown in SEQ ID No. 23" as recited in amended independent claims 9 and 18 of the present invention. Therefore, the Yu et al. reference does not cure the deficiency of the Seki, et al. and Bass references.

In view of the above, Applicants respectfully request withdrawal of the rejection of claims 7, 8, 11, 12, 16 and 18 under 35 U.S.C. § 103(a) as being obvious over Seki, et al. (1994, CA2104649), Bass (2001, Nature v. 411: 428-429, and Yu, et al. (2002, PNAS, v.99:6047-52).

Conclusion

This Amendment is being submitted together with a Request for Continued Examination, Information Disclosure Statement and a petition for a 3-month extension of time and a check in the amount of $2,100.00 for the fee due under 37 CFR §1.17(e), 37 CFR §1.17(p) and 37 C.F.R. §1.17(a)(3). It is believed that no further fees are due for this submission. If it is determined that additional fees are due or that any fee has been overpaid, the Commissioner for Patents is hereby authorized to charge said fee or credit any overpayment to Deposit Account No. 50-0552.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,
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